PSYCHOLOGICAL MEDICINE

Isolated Cerebellar Stroke Masquerades as Depression

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ABSTRACT

Objective: **There are numerous reports on neurological conditions masquerading as psychiatric disorders. However, cerebellar stroke is not established as one of it. The 2 case reports will highlight that this masquerade is possible and the physician's high index of suspicion is the key to accurate diagnosis.**

Results: **The case reports illustrated how a cerebellar stroke could be misdiagnosed as a depression due to its presenting symptoms of vertigo. The rarity of cerebellar stroke itself already posed a challenge for the physician to detect it but the mimicking of depression was the ultimate obstacle.**

Conclusion: **The acute onset strongly suggests an organic cause. It is important to ascertain depression through depressive mood, and not by behavioral changes alone. Correct diagnosis of cerebellar stroke is of paramount importance so that early intervention can be delivered to the patient.**

KEY WORDS

cerebellar stroke, depression, vertigo

INTRODUCTION

Cerebellar stroke is an emergency condition and missing it might lead to a lethal outcome. Although it constitutes only 1.5% incidence of all type of stroke, its mortality was 23% higher than any other stroke localisation. The most common presentation of cerebellar stroke is vertigo but not vice versa thus missing it would not be surprising[1)]. A study at an emergency department among patients who came for vertigo found that only 3% of them had cerebellar stroke[2)]. In these cases, the absence of gross neurological deficit made it more difficult to diagnose whereas the presence of vertigo and nausea made the patient appeared uncooperative and depressed. A lethal consequence may ensue if this diagnosis is missed and left untreated.

CASE 1

A 78-year-old lady was brought to emergency department for refusing to ambulate despite actively moving all the limbs for one day. Her speech was slurred and very minimal. The behaviour was interpreted as being uncooperative due to depression and was then referred for psychiatric assessment. She was a known case of depression, currently 10 years in remission, and multiple medical comorbidities including hypertension, hyperlipidemia, and gastritis. Shen was on oral amitriptyline 25 mg *omni nocte*, simvastatin 20 mg *omni nocte*, metoprolol 100 mg *bis in die*, felodipine 10 mg *omni mane*, and omeprazole 20 mg *omni mane*.

Upon further questioning, it appeared that she refused to ambulate and converse due to a moving sensation which caused her to feel unsteady suggestive of vertigo, and nausea for one day. There was no history of fall, body weakness, or loss of consciousness. Depressed mood was absent. She was fully independent in her daily activities the day before.

On examination, the patient was fully alert, conscious, and cooperative. The speech was slurred. Blood pressure and pulse rate were 130/59 mmHg and 90 bpm, respectively. There were dysdiadochokinesia, and past pointing of the left upper limb. Whenever she stood up, she showed imbalance and inability to step further. The tone, power, and reflexes of all limbs were unremarkable. All cranial nerves were intact. The results of full blood count, renal profile and liver profile were unremarkable. CT brain showed hypodensity at the left cerebellum in keeping with a new infarct. She was immediately referred to the medical doctor for further management of the left cerebellar stroke.

CASE 2

A 59-year-old man with diabetes mellitus and hypertension was admitted to the medical ward for diabetic ketoacidosis and hypertensive urgency due to default of his treatment. On admission, he was noted to be lethargic, dehydrated, and unable to stand up. He had been vomiting for two days straight. The blood pressure was 194/102 mmHg with pulse rate of 112 bpm. The tone, power, and reflexes of all four limbs were normal. Random blood glucose was 24.7 mmol/l. The venous blood pH was 7.2 and HCO_3 was 16.7 mmol/l. Ketone was presence in the urine. After four days of admission, the blood pressure was slightly high at 146/77 mmHg and blood glucose ranged between 7 and 10 mmol/l.

He was referred for psychiatric assessment after four days of admission as he was suspected to be depressed. He was confined to his bed, lying there all the time and refused to sit up, walked to the bathroom, or engaged in a long conversation. He became irritable when the staff told him to ambulate.

Upon further questioning, the patient revealed that he was experiencing a spinning sensation and he would fall back whenever he tried to

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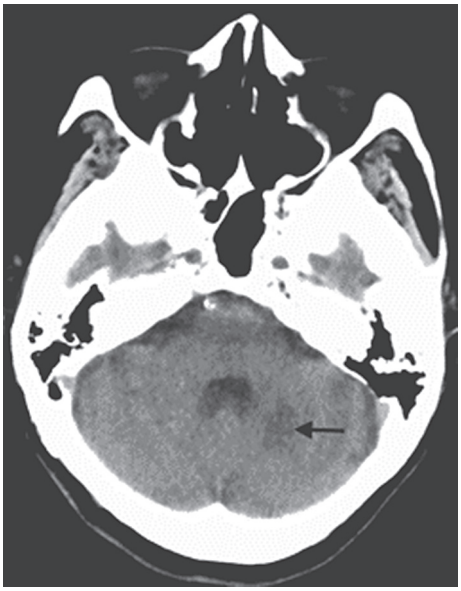

Figure 1. CT brain from case 1 showed infarct of the left cerebellum

Figure 2. CT brain from case 2 showed recent infarcts of the left cerebellum and superior cerebellar peduncle

sit up for past two days prior to admission. When he was asked to sit, the vertigo worsened that he started to vomit and could not engage in conversation anymore. Otherwise, there was no history or symptoms suggestive of depression. On examination, he fell to the left side when he sit, or stand up. There were positive cerebellar signs on the left side such as dysdiadochokinesia, and past pointing. Later, CT brain showed recent infarcts of the left cerebellum and superior cerebellar peduncle.

DISCUSSION

Vertigo is defined as a false perception or an illusion of motion in the absence of a real movement[3]. It is a very distressing experience particularly in an acute attack caused by cerebellar stroke. Vertigo reaches its maximal intensity immediately thus makes adaptation impossible. In 90% of the patient, the vertigo is accompanied with other unpleasant symptoms such as ataxia, nausea, vomiting, and nystagmus[4]. Seventy-one percent of cerebellar stroke patients are unable to walk by themselves thus masking the ataxic gait and it has a more subjective complaint that appears functional[1,4]. Further, the vertigo, imbalance, and nausea make them seem less cooperative causing a communication breakdown with the primary team and may result in the misdiagnosis of depression.

Depression is not uncommon and its prevalence in Malaysian community stood at 6.3% to 18%[5]. This high number of depression is alarming and many physicians are now aware of its existence. Even though this is a good development for psychiatry but it cost a high false positive of the depressive disorders diagnosis. Two different inpatient studies found that only 26% to 29% of all consultation-liaison psychiatric service referral for suspected depression actually suffer from a depressive disorder[6,7]. Even the primary care service did not escape from this depressive disorder masquerade whereby 45% diagnosed with depressive disorders actually did not have it[8].

When a patient presents with vertigo and the seemingly "depressive" behaviour such as uncooperative and refusing to ambulate, a physician must always try to elicit the cause of vertigo before concluding that this is depression. The organic conditions shall be the first in the list of differential diagnoses. The acute onset of illness, repeated spontaneous vomiting, inability to walk without support and sudden deterioration of good premorbid functioning incline towards an acute organic cause. Bostwick et al suggested that the intense reactive mood changes towards the surrounding with communication breakdown like in these cases hinted towards a non-functional disorder[7]. There are several possible conditions that may come with this presentation which are cerebellar stroke, acute vestibular neuritis, acute labyrinthitis, Meniere's disease, vertiginous migraine, and benign paroxysmal benign vertigo. Despite all cause devastating symptoms, cerebellar stroke carries higher morbidity and mortality risks thus it should always be ruled out first. There are several criteria that differentiate cerebellar stroke from the others which are the inability to walk without support, direction-changing nystagmus, unilateral hearing loss, and neurological deficit. The cerebellar stroke patient usually has an underlying cardiovascular risk factors and the vertigo intensity reached its peak instantly[9].

Although both case reports above did not exhibit mood symptoms including depression, cerebellar stroke itself is highly associated with affective dysregulation. Both of the patients had left cerebellar stroke. However, it was the right side that was significantly associated with depressive symptoms[10]. Intense emotions such as rage and fear were found to be remarkably triggered in the right posterior cerebellum[11]. Whether the patients would later develop depression could not be ascertained yet since both of the patients were only assessed within 4 days of stroke. Longer interval from the stroke onset increases the prevalence of poststroke depression which can be attributed to multiple risk factors[12]. It is also important to educate the public about stroke and its risk factors, since their knowledge is still moderate to poor[13].

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